Modeling Periodic Phenomena

**CORE STANDARDS**

F.TF.7

LESSON

**6-2**

 Secondary Math 3

OBJECTIVE **1. I can utilize inverse trig functions to solve equations.**

NOTES Sine and Cosine functions are periodic meaning that more than often there are more than one solution to a problem. We often limit results to $\left[0,2π\right] or \left[0, 360°\right]$



Ex: $\sin(x)=\frac{1}{2}$ when $x=\frac{π}{6},\frac{5π}{6}$, $\cos(x)=-\frac{1}{2}$ when $x=\frac{2π}{3}, \frac{4π}{3}$, and $\tan(x)=-0.79$ when $x=2.473, 5.6146$

When using the $sin^{-1}x$ and $tan^{-1}x$ function, the calculator will give you the angle in the range [-π, π] or [-90$°$, 90$°$]

When using the$ cos^{-1}x$ function, the calculator will give you the angle in the range [0, π] or [0,90$°$]

To find second answer for sine subtract first answer from $180° or π$.

To find second answer for cosine subtract first answer from $360° or 2π$.

 To find second answer for tangent add $180° or π$ to first answer.

EXAMPLES

1. $\cos(x)=0.75$
2. $\sin(x)=\frac{\sqrt{3}}{2}$
3. $\tan(x)=5$
4. $2\sin(x)-1=0$
5. $4\cos(x)=-3$
6. $\tan(x)+4=3$
7. $\sin(x)\cos(x)-3\cos(x)=0$
8. A heater turns on in a home when the outside temperature is below 45°F . During the middle of March in Salt Lake City, you can model the outside temperature in degrees Fahrenheit using the function $\left(t\right)=43+9.5\cos(\left(\frac{π}{12}t\right))$, where t is the number of hours past noon. During which hours is the heater heating the home?

PRACTICE **6-2** NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 [SHOW YOUR WORK]